

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated November 10, 2003 (U.S. Patent Office Paper No. 1003). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claim 4 is being canceled without prejudice or disclaimer, while claim 1 is being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. Applicants respectfully submit that no new matter is being introduced into this application through the submission of this response.

Prior Art Rejections

Claims 1 to 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kanou *et al.*, U.S. Patent No. 6,407,784 B1 (further, Kanou '784) in view of Jang *et al.*, U.S. Patent No. 6,522,375 B1 (further, Jang '375).

Applicants respectfully disagree with the rejection and submit that amended claim 1 recites a liquid crystal display device being characterized in that the liquid crystal device has a pair of substrates which are arranged to face each other while inserting liquid crystal therebetween, to respective liquid-crystal side pixel regions formed on one of the substrates, pixel electrodes which reflect an external light incident through the other substrate are provided, the pixel electrodes are formed such that protruding portions are scattered on surfaces thereof and respective protruding portions are provided in two or more kinds which are different in shape from each other when the pixel electrodes are viewed in a plan view, and the protruding portions formed on the surfaces of the pixel electrodes are formed of island-like multi-layered material layers which are positioned at the lower layer sides of the pixel electrodes, wherein in each island like multi-layered material layer, the center position of the shape of one layer is offset from the center position of the shape of other layer.

The Examiner alleges in the Office Action on page 2, line 24 to page 3, line 4 that Kanou '784 discloses protruding portions that are provided in two or more kinds which are different in shape from each other when the pixel electrodes are viewed in plane view. Applicants respectfully disagree. As indicated in the specification of the present application,

paragraph [0011] explains that "In the liquid crystal display device having such a constitution, with respect to the protruding portions formed on the surface of the pixel electrodes, two or more kinds of protruding portions formed on the surface of the pixel electrodes, two or more kinds of protruding portions which are different in shape when the pixel electrodes are viewed in a plan view are present so that the light beams which are reflected on side surfaces of the protruding portions of the pixel electrodes hardly interfere with each other. Accordingly, the quality of the display can be enhanced."

Applicants respectfully submit that Kanou '784 at most only discloses in col. 6, lines 18-19 that "the protruding portions may be formed pillar-shaped or strip-shaped" and that "the protruding portions may have different shapes (rounded, squared, triangular, etc...) when viewed in plan view." In fact, Kanou '784 does not disclose, teach or suggest a mixed configuration with two or more different shapes because it discloses, at least in the following instances, see col. 4, lines 24 to 30, that "It is preferable that the projection is formed to be pillar-shaped, in which case, the projection is preferably spaced away from adjacent projection by a distance in the range of 3 μm to 20 μm both inclusive in a plane parallel to the first substrate. As an alternative, the projection may be formed to be strip-shaped" or, see col. 5, lines 42-43, that "the projection may be formed in step (b) to be pillar-shaped or strip-shaped." In all instances cited above the pillar-shape or its alternative, the strip-shape are disclosed. There is no instance in Kanou '784 where the two shapes are used in the same time, therefore no mixed configuration of two or more different shapes is used for the protruding portions. Based on the actual disclosure of Kanou '784, one of skill in the art would at best interpret this reference as showing that protruding portions could be either all pillar-shaped or all strip-shaped. This reference provides no other teaching or suggestion.

Applicants would contend that the Examiner is in actuality extrapolating his finding based on his knowledge of the disclosure of the present invention. Applicants would submit that, since the Examiner has provided no other reference to show the above-noted feature of the present invention, the only teaching available to the Examiner of protruding portions being of mixed configurations is the disclosure of the present invention itself. It is well established that a rejection based on information that an examiner gleans from the knowledge of the invention at issue is improper.

In addition, contrary to the Examiner's conclusion that the protruding portions may have different shapes when viewed in plan view, Kanou '784 does not even provide a plan view of the structures that it does disclose, only cross-sectional views. Therefore, the

Examiner has no prior art reference available to support his position that the structure of the claimed invention "when viewed in a plan view" would have been known in the prior art. The only disclosure of how protruding portions may appear in a plan view is again only available from the disclosure of the present invention itself. Once again, the Examiner has improperly used his knowledge of the present invention as a basis for rejecting that same invention.

Further, Applicants also disagree with the Examiner's allegation made in the office action on page 4, lines 16 to 19. The Examiner's position is that the disclosure of Figs. 3, 7, and 11 anticipates the recitation of claim 1 and shows that layer 30 of island 5, which is part of each island-like multi-layered material layer has the center position offset from the center position of the shape of other layers of the protruding portion 73. Applicants respectfully submit that Kanou '784 discloses in col. 8 that numeral 5 corresponds to active matrix device 5, a thin film transistor, that differs from the protruding portion 73. Kanou '784 does not define the active matrix device as being one of the protruding portions 73.

Further yet, Kanou '784 discloses that layer 30 of island 5 is not an island and is not part of each island-like multi-layered material layer. Layer 30 is disclosed by Kanou '784 as having a contact hole 23 that connects the reflective electrode 74 and the source electrode 21 of active matrix device 5. Contact hole 23 does not divide layer 30 of island 5 from layer 30 that covers the protruding portion 73.

Due to the reasons outlined above, Applicants will contend that Kanou '784 cannot anticipate or render obvious each and every feature of the present invention as claimed in claim 1.

Jang '375, used by the Examiner as secondary reference to construe the above rejection is equally deficient in disclosing, teaching or suggesting the feature of claim 1 "the pixel electrodes are formed such that protruding portions are scattered on surfaces thereof and respective protruding portions are provided in two or more kinds which are different in shape from each other when the pixel electrodes are viewed in a plan view". Jang '375 only shows a plurality of convex polygons separated by ravines but the protruding convex polygons are not "formed of island-like multi-layered material layers" as recited in claim 1.

The Examiner alleged in the office action on page 4 that Figs. 2 and 3 of Jang '375 disclosed a reflection type liquid crystal device comprising a pixel electrode which includes a plurality of convex polygons each of which has different shapes and sizes so as to maximize the reflectivity and to minimize non-homogeneous alignment.

Regarding the disclosure of Jang '375 Applicants respectfully submit that Figs. 10 and 11 disclose an insulating layer 116 and a contact hole 164. The insulating layer 116 is not an island. The insulating layer 116 is not a part of each island-like multi-layered material layer.

Due to the reasons outlined above, Applicants will contend that Kanou '784 and Jang '375, either singly or in combination, do not anticipate or render obvious each and every feature of the present invention as claimed in claim 1. The combination of references fails to disclose, teach or suggest at least the feature of claim 1: "in each island-like multi-layered material layer the center position of the shape of one layer is offset from the center position of the shape of other layer". Applicants respectfully request the Examiner to reconsider and thereby withdraw the rejection regarding claim 1.

Regarding Examiner's rejection of claims 2 to 13, as outlined above, the prior art cited fails to disclose, teach or suggest each and every feature recited in claim 1. Since claims 2 to 13 depend from claim 1, Applicants will submit that the same prior art cannot be used to anticipate or render obvious the present invention as recited in claim 1 and as further limited by claims 2 to 13. In essence, both Kanou '784 and Jang '375 fail to disclose, teach or suggest, among other features, a mixed configuration of island-like, multi-layered material layers that have "different number of layers", or "a mixed configuration of island-like multi-layered material layers whose shape of one layer is different from corresponding one layer of other island-like multi-layered material layers when the island-like multi-layered material layers are viewed in a plan view."

The remaining claims 5 - 13 are dependent from and add features to the claims discussed above. In view of the above arguments, Applicants will contend that they are also allowable for at least the same reasons.

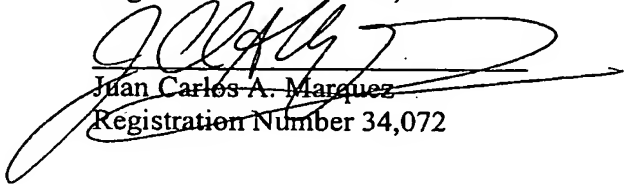
Conclusion

In view of all the above, Applicants respectfully submit that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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